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THE GEORGE WASHINGTON UNIVERSITY
Graduate School of Arts and Sciences

THE RESPONSIVENESS OF REENLISTMENT TO
CHANGES IN NAVY COMPENSATION

by

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13. ABSTRACT

This paper examines the response of reenlistments in the Navy to the large increase in military pay in 1971. The major finding of the paper is that the pay elasticity was quite high. Also examined is the structure of rank and, hence, pay among Navy occupations. Although military pay appears to be an effective inducement to reenlistment, improved allocation of pay can result in a preferred mix of reenlistments.

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This paper examines the response of reenlistments in the Navy to the large increase in military pay in 1971. The major finding of the paper is that the pay elasticity was quite high. Also examined is the structure of rank and, hence, pay among Navy occupations. Although military pay appears to be an effective inducement to reenlistment, improved allocation of pay can result in a preferred mix of reenlistments.

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0. Introduction

Most studies of the elasticity (responsiveness) of reenlistment
rates to pay incentives compare pay in the military with some index of
pay expected in civilian employment. Such comparisons can be improved
upon by taking account the probability (less than unity) of obtaining
expected civilian pay, i.e., the fact that there is unemployment and
under-employment in the civilian labor market. But the main require-
ment is that comparisons be made between appropriate civilian and mili-
tary occupations. The enlistee who has a particular skill will compare
it with the closest substitute occupation in civilian life.

Despite the need for studies which disaggregate reenlistment de-
cisions by comparing military pay with civilian pay in comparable occu-
pations, it is possible under special circumstances to estimate reenlist-
ment elasticities relative to military earnings without detailed matching
information on occupational earnings in the civilian labor market. Such
a situation prevailed in the early 1970's when a large increase in mili-
tary pay was instituted. In comparing reenlistment rates in the period

immediately preceding and immediately following November 1971 when the
military pay increase went into effect, it can be reasonably assumed that
corresponding civilian occupational earnings were relatively unchanged.
To the extent that expectations of alternative civilian earnings did in-
crease during the period, the elasticities calculated on the basis of the
military pay increase alone will understate the responsiveness of the re-
enlistment decision to pay incentives.

1. The Pay Increase

On 14 November 1971, the military services received a large pay
raise, particularly in the lower pay grades, so as to make military ser-
vice more attractive to young people. In assessing the impact of the pay
increase on reenlistment rates, we assume that individuals who chose to
reenlist during fiscal year 1971 were acting on the basis of the pay
scales in effect on January 1971, although some individuals may have
opted to reenlist in anticipation of the proposed pay changes. Thus, it
is assumed that the average pay levels prevailing in January 1971 are
representative of the "before-pay raise" period. Likewise, it is assumed
that the January 1972 average pay levels are representative of the "after-
pay raise" period, and that individuals reenlisting in fiscal year 1972
were acting on the basis of pay rates effective on 14 November 1971
(although some making a reenlistment decision before that date may have
been unaware of the forthcoming pay increase).

Comparison of reenlistment rates in 1971 and 1972 does not provide
a pure measure of response to pay increases in the Navy. There were in-
creases in civilian pay during this period, but naval pay increases were
so much larger than civilian pay increases that they can be reasonably
assumed to have dominated reenlistment responses. An additional problem
encountered in estimating pay reenlistment elasticities for the Navy is
that variable reenlistment bonuses (VRB) are offered in some ratings,
i.e., occupations, but not in others. The pay increase is a smaller per-
centage of total compensation where this additional form of compensation
applies than where it does not. This means that the calculated elastic-
ities for Navy occupations where a VRB is offered are understated when

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the dollar value of the VRB is not considered.

The information on average pay underlying this study is for first-term enlisted personnel serving in their fourth year as of the dates shown in Table 1. Thus, the pay information represents military earnings at the point in time when reenlistment decisions were being made. The pay data refer to regular military compensation which includes base pay, subsistence and housing allowances, and the tax advantage associated with the latter benefits.

TABLE 1

Regular Military Compensation By Rank $\underline{a/}$

	E-3	E-4	E-5
Jan. 1971	4,406	5,349	6,572
Jan. 1972	5,800	6,195	7,148

$\underline{a/}$ For first-term enlisted personnel serving in their fourth year.

Source: Unpublished data from the Directorate of Compensation, Department of Defense.

2. First-Term Reenlistment Rates

Corresponding to the information on pay, information is available on Navy reenlistments among first-termers eligible to reenlist[1] during

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[1] In order for a first-termer to be eligible for reenlistment, he must be in pay grade E-4 or above, or if an E-3, he must have passed an examination for advancement to E-4 and be currently recommended for advancement. The requirement for passing the E-4 examination may be waived by an individual's commanding officer when it is his opinion that the individual has the potential for sustained excellent performance. The question of whether to grant a waiver resolves itself to the determination of whether the commanding officer desires to have the individual continue to serve in his command. See [7, p. 1].

fiscal years 1971 and 1972. These data for first-term enlistees only are
shown in Tables 2 and 3. Table 2 contains reenlistment rates for ratings
in which no variable reenlistment bonus was offered as of June 1971;
Table 3 contains similar information for ratings in which a VRB was of-
fered.[2] Since the VRB may be as high as $2,000 per year over a four-year
period, one might expect a different pattern of reenlistment rates for
the former group of ratings than for the latter. Examination of reenlist-
ments in ratings eligible for a VRB is of particular importance since
this category contained 69.4 percent of all individuals eligible for re-
enlistment in FY 72.

The reenlistment data are further broken down by the Department
of Defense occupational group. The groupings used are as follows:

Civilian Occupation Group	DOD Occupational Group
Craftsmen	Electronic Equipment Repairmen Electrical/Mechanical Equipment Repairmen Craftsmen
Clerical	Administrative Specialists and Clerks
Service	Service and Supply Handlers [a]
Miscellaneous	Infantry, Gun Crews, and Seamanship Specialists Communications and Intelligence Specialists Medical and Dental Specialists Other Technical and Allied Specialists [b]

a/ Excludes stewards.

b/ Includes photographers, weathermen, musicians, etc.

[2]The variable reenlistment bonus is payable in equal yearly install-
ments to provide additional financial incentives to enlistees serving in
a designed critical military skill upon their first reenlistment. See
[8, p. 7514].

TABLE 2

First-Term Reenlistment Rates by Pay Grade for Ratings with No Variable Reenlistment Bonus

	Pay Grade			
Occupational Group	E-3	E-4	E-5	Total
FY 71:				
Craftsmen	1.2	4.6	15.1	7.9
Clerical	2.5	8.7	18.0	12.1
Service a/	b/	20.7	23.8	21.2
Miscellaneous	3.8	6.5	19.0	10.1
Total a/	2.1	7.5	17.3	10.6
FY 72:				
Craftsmen	5.0	7.3	21.0	11.9
Clerical	10.7	15.6	19.9	17.5
Service a/	b/	17.7	25.3	20.1
Miscellaneous	9.6	8.6	21.7	13.1
Total a/	7.3	11.0	21.0	14.7

a/ Excludes stewards.

b/ Less than 100 individuals eligible for reenlistment.

Source: Department of the Navy, Navy and Marine Corps Personnel Statistics, Bureau of Naval Personnel, NAVPERS 15658, Headquarters U. S. Marine Corps, 30 June 1971 and 30 June 1972.

TABLE 3

First-Term Reenlistment Rates by Pay Grade for
Ratings with a Variable Reenlistment Bonus

		Pay Grade		
Occupational Group	E-3	E-4	E-5	Total
FY 71:				
Craftsmen	7.4	15.2	32.3	24.8
Clerical	a/	8.7	21.5	14.0
Service b/	-	-	-	-
Miscellaneous	2.6	7.5	16.9	12.5
Total	4.6	12.4	26.9	20.4
FY 72:				
Craftsmen	17.4	24.9	38.0	31.9
Clerical	-	12.8	14.7	13.6
Service b/	-	-	-	-
Miscellaneous	10.8	12.4	19.9	16.1
Total	14.4	21.2	33.0	27.3

a/ Less than 100 individuals eligible for reenlistment.

b/ No skill rating in this occupational group was eligible for a reenlistment bonus.

Source: See Table 2.

The occupational groupings chosen represent a broad range of skills and except for the miscellaneous group are relatively homogeneous. The miscellaneous group contains a diversity of skills ranging from those with little training, such as Signalmen, to those which require extensive training, such as Electronics Warfare Technicians. Because of the heterogeneity of the miscellaneous category, attention is directed at the craftsmen, clerical, and service occupations.

The Navy rating "stewards" is omitted from Navy service workers in Table 2. The stewards rating has an exceptionally high reenlistment rate,[3] perhaps because the rating was almost wholly composed of Filipinos whose earnings in the Navy are much higher than they would be at home.

In assessing the figures in Tables 2 and 3, the definition of re-enlistment used by the Navy should be borne in mind. A reenlistee is one who signs a second enlistment contract or extends his first enlistment contract for two or more years. The latter category of reenlistment can occur in two ways. In one way, an individual completes four years of service and then decides to extend his enlistment contract for two years in order to be eligible for additional training. At the end of the sixth year, he has the same options, i.e., reenlisting, extending his contract once again, or separating from the Navy, as the individual who reenlists for two years after serving four years of his initial enlistment contract. A second type of extension pertains to 6YO programs. In this case, an extension of two years, in addition to the four years obligated by the initial enlistment contract, is a precondition to receipt of training. Individuals who continue in the program after completing the initial four-year contract are likewise counted as reenlistees. Because such individuals extend their service obligation early in their initial enlistment period in order to qualify for training, there is some question

[3]First-term reenlistment rates for the stewards rating (which is a non-VRB rating) were as follows:

	E-3	E-4	E-5
FY 71	82.2	98.3	100.0
FY 72	86.6	96.8	100.0

whether they should be counted as reenlistees or six-year enlistees. This problem poses a difficulty in interpreting the reenlistment data, since 6YO's are concentrated in the craftsmen ratings eligible for a VRB. Fortunately, the large number of candidates for reenlistment, approximately 65,000, mitigates against this definitional problem disturbing the underlying cross-sectional reenlistment relationships. More importantly, the definitional problem pertains to both the FY 71 and FY 72 reenlistment data. Indeed, the larger the bias, the more likely are reenlistments to be unresponsive to changes in pay over time and, hence, can lead to understatement of the pay reenlistment elasticity. The problem noted, however, suggests that the definition of reenlistment requires further study.[4]

As can be seen by comparing Tables 2 and 3, in all cases except one, reenlistment rates increase with rank, suggesting that the higher the military pay, the more attractive is military service. Closer examination of the data indicates, however, that the relationship between the reenlistment rate and rank is nonlinear. For example, in the non-VRB ratings, the reenlistment rate of E-4's in the craftsmen occupations was 2.3 percentage points higher than that of E-3's in FY 72. The difference between the reenlistment rate of E-5's[5] and E-4's was 13.7 percentage points. Reenlistment rates also tended to be higher for the VRB ratings than for the non-VRB ratings, particularly in the craftsmen occupations but less so in the clerical and miscellaneous occupations.[6] Additionally, among the non-VRB ratings, reenlistment rates are low for the craftsmen occupations and higher for the clerical and service occupations when pay grade is held constant. This is in accord with what we

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[4]The simplest solution, of course, would be to separately classify individuals in 6YO (or similar) programs. The data utilized in this study do not provide this level of detail.

[5]The E-5 group includes a small number of E-6's. For simplicity, the group is referred to as the E-5 rank.

[6]For other evidence of a positive association between the reenlistment rate and the VRB, see [1].

know concerning civilian pay in these occupations. In 1969, the median earnings of service workers was 35 percent less than that of craftsmen in the civilian sector; the median earnings of clerical workers was 14 percent lower than that of craftsmen (see Table 4). On the other hand, for the VRB ratings, reenlistment rates are higher among the craftsmen occupations than among the clerical occupations (VRB was not offered in the service occupations). This may be due to the higher VRB in the craftsmen occupations, but could also result from the way reenlistments are defined.

3. Skill Level and Reenlistment

One explanation for the observed nonlinearity in reenlistments may relate to differences between the internal structure of pay in the military and civilian sectors.[7] It may be, for example, that the pay of E-5's relative to E-4's is high vis-a-vis the pay differential for similar skill levels in the civilian sector. One obvious problem in evaluating this hypothesis is the difficulty of defining corresponding skill levels in the two sectors. Another difficulty is estimating civilian pay by skill level.[8]

One source of information on civilian pay by skill level is the Bureau of Labor Statistics Area Wage Surveys. This source classifies workers into Classes A, B, and C skill levels. Workers in Classes A and B work under general direction. The former is competent in a wide range of tasks; the range of tasks in which the latter is competent is more limited. Class C workers generally work under close supervision and only on routine tasks.[9] These skill level descriptions suggest the

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[7] By internal structure we mean the dispersion of pay skill level within occupations.

[8] Note should be taken of the distinction between a "skill rating" and "skill level." The former refers to occupational training, the latter to level of expertise exhibited in a particular occupation as indicated by rank.

[9] See [4, pp. 97-100].

following equivalency:

Class C   E-3
Class B   E-4
Class A   E-5.

Unfortunately these data are available for only a few occupations -- two office occupations (accounting clerks and tabulating machine operators) and four professional occupations (computer operators, programmers, systems analysts, and draftsmen).[10] The data that are available are summarized in Table 4. As can be seen, based on this source, the dispersion of wages is found to be the same in the military and civilian sectors.

Another source for measuring pay differentials by skill level is Census data. We calculated first quartile, median, and third quartile earnings of males age 18-24 who worked 50-52 weeks in 1969. Measures of dispersion based on these data are shown for the craftsmen, clerical, and service occupations. They are illustrative estimates only, since the use of aggregated occupational groupings tends to overstate the dispersion of earnings. Equating the three levels of military skill with the first, second, and third quartiles of civilian workers, the Census data suggest that the dispersion of civilian pay is greater than the dispersion of military pay. In view of these findings, it is somewhat surprising that the reenlistment rate differential between the E-4 and E-5 pay grades is as steep as it is. It may be that what we are observing is a threshold effect, i.e., the E-5 salary is viewed as the minimum military pay which makes reenlistment a viable alternative to civilian employment. It should be noted, however, that the increase in the reenlistment rate as rank increases may be due to other factors besides pay. In particular, greater responsibility and authority are also associated with higher rank. For this reason, estimation of reenlistment elasticities with respect to pay using cross-section data can be hazardous. The influence of rank, as distinguished from pay, on the reenlistment decision is examined elsewhere.[11]

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[10] Pay data based on a different classification of skill for a wider range of professional occupations is also published in [6]. These data were not examined.

[11] See [3].

TABLE 4

Wage Differentials by Level of Skill, Military and Civilian Sectors

Military:	E-3 ÷ E-4	E-4 ÷ E-5
Jan. 1971	.82	1.23
Jan. 1972	.94	1.16

Civilian (BLS):	Class C ÷ Class B	Class A ÷ Class B
1971:		
Office Occupations [a/]	.86	1.19
Professional Occupations [b/]	.85	1.18
1972:		
Office Occupations [a/]	.84	1.21
Professional Occupations [b/]	.85	1.19

Civilian (1970 Census of Population): [c/]	Q1 [d/] ÷ Median	Q3 [e/] ÷ Median
Craftsmen ($6,063)	.68	1.30
Clerical ($5,236)	.62	1.32
Service ($3,943)	.54	1.56

a/ Averages for two office occupations.

b/ Averages for four professional occupations.

c/ Median earnings of males in parentheses.

d/ First quartile earnings (Q1).

e/ Third quartile earnings (Q3).

Sources: Unpublished data from the Directorate of Compensation, Department of Defense, U.S. Department of Labor, Area Wage Surveys, Bureau of Labor Statistics, Bulletin 1685-92, 1973, Tables A-1 and A-6; and U.S. Department of Commerce, Occupation Characteristics, 1970 Census of Population, PC(2)-7A, June 1973, Table 23.

4. Elasticity of First-Term Reenlistment With Respect to Pay

Given the reenlistment rate and pay data previously described, we are now in a position to calculate the elasticity of reenlistment with respect to military pay for first-term enlistees. The pay elasticity is of importance since it is an estimate of the sensitivity of the reenlistment rate to changes in military pay and, hence, provides a cost-benefit measure of the effectiveness of pay in increasing reenlistments. The figures shown in Table 5 are arc elasticities computed in the standard manner, i.e., the percentage change in the reenlistment rate for each rank-occupation group is divided by the percentage change in pay for the rank.[12] As the number of candidates for reenlistment varies from year to year, the numerator of the elasticity measure is measured in terms of the reenlistment rate instead of the number of reenlistments.

The period covered is 1971-72. During this period military pay rose sharply by 14.5 percent in the non-VRB ratings, by 11.3 percent in the VRB ratings.[13] In contrast, during the same period, the pay of production and non-supervisory employees on non-agricultural pay rolls rose by 7.0 percent.[14]

The most striking feature of Table 5 is the high elasticity of reenlistment with respect to pay, particularly for the non-VRB ratings. Of the 19 cells for which estimates could be made (excluding the "total" columns and rows), the pay elasticity exceeded 3.00 to 9 instances. In two instances, however, the elasticity was negative. In one case, the E-5 rank for the clerical occupations, the average number of candidates was 271. In the other case, the E-4 rank for the service occupations,

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[12] In both cases, the denominator of the percentage change figure is the sum of initial and terminal date values.

[13] The difference between the two groups of ratings is accounted for by the higher proportion of individuals in the lower pay grades in the non-VRB ratings.

[14] See [5].

TABLE 5

Elasticity of Reenlistment With Respect to Military Pay, 1971-72

| | Ratings With No VRB | | | | Ratings With a VRB | | | |
	E-3	E-4	E-5	Total	E-3	E-4	E-5	Total
Craftsmen	4.49	3.10	3.50	3.06	2.95	3.30	1.93	2.40
Clerical	4.53	7.16	1.19	2.68	-	2.62	-4.47	-0.26
Service b/	a/	-1.07	0.74	-0.40	-	-	-	-
Miscellaneous	3.17	1.90	1.58	1.91	4.48	3.23	1.94	3.01
Total b/	4.04	2.59	2.31	2.38	3.77	3.59	2.43	2.69

a/   Less than 100 observations.

b/   Excludes stewards.

Source: Tables 1, 2, and 3.

the average number of candidates was 1,304. The total number of candidates over all ratings, on the other hand, averaged almost 65,000. Thus, although the two negative elasticities stand out, they pertain to only a very small proportion of those eligible for reenlistment. The overall high pay elasticities suggest that pay does play an important role in the reenlistment decision.

In terms of rank, the lowest pay elasticity occurs for E-5's in the VRB occupations. In terms of occupation, the lowest pay elasticity occurs in the service occupations (in which no VRB is offered). In both cases, the reenlistment rates before the pay increase were high. As mentioned earlier, the first group is eligible for a VRB; for this pay grade the VRB is substantial, in the neighborhood of $1,000 per year. The opportunity cost of employment in the civilian sector is relatively low for the second group. Each of these factors leads to high reenlistment rates irrespective of military pay. In general, the pay elasticity tends to be smaller in the VRB ratings than in the non-VRB ratings, although as indicated above, omission of the VRB from the pay base leads to an understatement of pay elasticity among the latter ratings.

Unfortunately, the impact of the Vietnam War, which would also operate to raise reenlistment rates during 1971-72, cannot be separately quantified. There are two reasons for believing, however, that the impact may have been quite small. First, between FY 67-68, the years when our sample population entered the Navy, the strength of the Navy (and also of the Armed Forces as a whole) was rising.[15] Hence, the proportion of the candidates for reenlistment during FY 71-72 who were draft-induced was probably stable, and may even have risen. Second, Navy strength reached a peak, 776,000, in June 1969. Although it fell to 588,000 by June 1972, almost one-half of the decline had occurred between June 1969 and June 1970. That is to say, reduced Navy involvement in Vietnam, as evidenced by Navy strength, was clearly underway well before the implementation of the steep rise in military pay.

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[15][See following page for footnote].

5. The Distribution of First-Term Enlistees by Pay Grade

The first-term reenlistment data by pay grade and occupation offer some insight into pay differentials within the Navy. A rational pay structure should conform to the guidelines that (1) average regular military compensation in VRB ratings should exceed average pay in non-VRB ratings and (2) within each group of ratings, average regular military compensation should approximate opportunity costs in the civilian sector. On the basis of each of these criteria, it appears that the structure of pay in the Navy can be improved (see Table 6). Although the VRB ratings have a higher proportion of E-5's than the non-VRB ratings, the difference

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[15] Total Department of Defense and Navy military personnel on active duty are shown below.

Active Duty Military Personnel
(in 000's)

	DOD	Navy
30 June 1960	2,476	618
30 June 1962	2,808	666
30 June 1964	2,687	668
30 June 1966	3,094	745
30 June 1967	3,377	752
30 June 1968	3,545	762
30 June 1969	3,460	776
30 June 1970	3,066	693
30 June 1971	2,714	623
30 June 1972	2,323	588
30 June 1973	2,253	565

Source: U.S. Department of Defense, Selected Manpower Statistics, Directorate of Information Operations, May 15, 1973, p. 21.

TABLE 6

Distribution of Individuals Eligible
For First Reenlistment by Pay Grade and Occupation

Occupational Group	Without a VRB			With a VRB		
	E-3	E-4	E-5	E-3	E-4	E-5
FY 1971:						
Craftsmen	5.0	62.3	32.7	1.1	42.3	56.7
Clerical	4.4	56.4	39.1	6.8	50.4	42.8
Service a/	2.9	64.4	32.7	b/	-	-
Miscellaneous	4.5	65.5	30.1	2.8	42.8	54.3
Total	4.6	61.2	34.2	2.0	42.6	55.7
FY 1972:						
Craftsmen	3.7	62.1	34.2	1.6	44.4	54.0
Clerical	2.2	51.6	46.1	2.1	43.8	54.1
Service a/	4.1	61.6	34.3	-	-	-
Miscellaneous	4.3	60.0	35.6	2.9	46.3	48.5
Total a/	3.2	58.5	38.4	2.0	44.9	53.1
FY 1973:						
Craftsmen	4.2	60.6	35.1	2.8	49.9	47.3
Clerical	1.7	51.0	47.3	3.9	45.0	51.2
Service a/	2.9	65.1	32.0	-	-	-
Miscellaneous	3.5	65.7	30.8	4.3	50.5	45.2
Total a/	3.1	58.8	38.2	3.2	50.0	46.7

a/ Excludes stewards.

b/ No skill rating in this group was eligible for a reenlistment
    bonus.

Source: See Table 2.

has narrowed substantially during FY 72-73. In FY 73 the proportion of first-termers in their fourth year who were in pay grade E-5 was about 9 percentage points higher in the VRB ratings than in the non-VRB ratings. The average regular military compensation for the former ratings was $7,034 in 1973, only one percent higher than for the latter. Thus apart from the VRB bonus, there is very little difference in average pay, at time of reenlistment, among non-VRB and VRB ratings. As a further example of pay disparity, the military compensation of clerical workers exceeded that of craftsmen by 2 percent. As noted previously, in the civilian sector the median pay of male clerical workers was about 14 percent less than that of male craftsmen.

6. Career Reenlistments

The discussion so far has been restricted to first-term reenlistments. Another important, but numerically smaller, class of reenlistments is career reenlistments. Careerists are defined as individuals who have signed two or more service contracts, i.e., have reenlisted one or more times. In the Navy this means that the individual has typically served six or more years at the time his second or higher reenlistment decision is made. Reenlistment rates for the careerist class are shown in Table 7. Since the VRB is offered only at first-reenlistment, no distinction between VRB and non-VRB ratings is made for careerists.

As can be seen from Table 7, reenlistment rates again increase uniformly with rank. Even more noticeable is the generally high level of career reenlistment rates, which suggests that factors other than pay play an important role in the careerist's decision to reenlist. For example, for pay grade E-5 or less, which contain many individuals age 24-27, the reenlistment rate is over 50 percent. Although turnover decreases with age, there is no reason to believe that age would bar anyone in this group from finding employment in the civilian sector. More likely, it is the potential of obtaining a pension after 20 years of service at age 38-39 which explains the high reenlistment rate of careerists. Thus, the availability of a pension at an early age may have a strong inhibiting effect on turnover. This is a large benefit to the military, but a

TABLE 7

Career Reenlistment Rates
Pay Grade and Rating

| | Pay Grade | | | | |
Occupational Group	E-4	E-5	E-6	E-7-E-9	Total
FY 1971:					
Craftsmen	52.6	73.2	85.1	98.7	86.7
Clerical	59.2	84.6	95.5	99.2	93.9
Service a/	b/	88.0	97.3	99.9	93.6
Miscellaneous	55.2	76.5	93.2	99.3	92.3
Total a/	55.9	76.5	89.1	99.0	89.4
FY 1972:					
Craftsmen	57.5	73.9	88.0	98.9	88.6
Clerical	69.0	84.6	96.4	99.9	95.3
Service a/	70.1	-	-	98.8	92.8
Miscellaneous	61.2	77.6	93.1	99.3	92.6
Total a/	61.0	77.0	91.0	99.2	90.8

a/ Excludes stewards.

b/ Less than 100 individuals eligible for reenlistment.

Source: See Table 2.

benefit that has its associated cost. The obvious cost is the added expense to national defense that payment of pension benefits incur. A less obvious cost is the potential gain in man-years that might be realized if pensions were paid at age 55 or a later age as is typical in the civilian sector. Given the large proportion of Navy personnel in the craftsmen occupations,[16] increased service life may not imply reduced productivity as would be the case if the Navy were comprised primarily of "foot soldiers."

One additional observation is evident from Table 7. Except for the lowest ranks of the clerical occupations, reenlistment rates increased very little during FY 71-72, again suggesting that other factors besides pay influence the reenlistment decision of careerists.

Analogous to the discussion of the distribution of first-termers by pay grade, the distribution of careerists by pay grade is shown in Table 8. With the exception of the service ratings, the distribution of pay among occupations appears to be uniform.[17] In light of the similarity in the rank distributions for first-term enlistees, it is not unlikely that opportunities for promotion for careerists are similar in most military occupations. If this is indeed the case, it would suggest that careerist wage differentials in occupations in short supply should be increased to reduce the cost of maintaining desired force composition and levels. Again, a more detailed analysis, although warranted, is beyond the scope of this paper.

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[16]See [2].

[17]It is often difficult to assess the extent of opportunities for promotion from a frequency distribution by pay grade when individuals with different lengths of service are grouped together. Data classified in this manner do not indicate the time needed to reach a particular grade. (This shortcoming is absent from Table 6 since, for the most part, the data pertain to a single cohort of first-term enlistees). More detailed data for cohorts enlisting at the same time would be preferred to the data portrayed in Table 8. Because of the difficulty of obtaining such data, they would not be examined.

TABLE 8

Distribution of Individuals Eligible for
Second and Additional Reenlistments
by Pay Grade and Occupation

Occupational Group	E-4	E-5	E-6	E-7-E-9
FY 1971:				
Craftsmen	2.9	17.4	46.2	33.6
Clerical	3.3	15.6	46.4	34.7
Service a/	6.0	29.5	44.2	20.3
Miscellaneous	2.8	13.6	44.9	38.7
Total a/	3.1	16.7	45.8	34.4
FY 1972:				
Craftsmen	3.2	16.3	44.6	35.9
Clerical	3.4	12.5	47.5	36.5
Service a/	8.0	27.9	39.6	24.5
Miscellaneous	2.9	12.1	48.4	36.5
Total a/	3.3	15.4	45.5	35.8
FY 1973:				
Craftsmen	2.3	15.2	45.7	36.8
Clerical	3.1	13.5	46.2	37.2
Service a/	4.3	29.7	41.3	24.7
Miscellaneous	2.1	14.2	42.7	41.0
Total a/	2.5	15.2	44.8	37.5

a/ Excludes stewards.

Source: See Table 2.

7. Summary

This paper has examined the response for first-term reenlistment rates in the Navy to the pay increase in 1971. The measure of pay used in the analysis consisted of base pay plus subsistence and housing allowances, whether in cash or in kind, and the tax advantage associated with such allowances. The major finding of the study is that the pay elasticity was quite high. In almost one-half of the cases, the pay elasticity exceeded 3.0 indicating that a one percent increase in pay resulted in a three percent increase in reenlistment rates.

The findings on reenlistment rates by rank were not entirely consistent with apparent opportunity costs, i.e., with equivalent civilian occupational earnings. Reenlistment rates for ranks E-5 and above were higher than expected. The hypothesis that rank has an effect on reenlistment that is distinct from the effect of associated pay is examined in another paper.

Also examined were the distributions of rank of first-term enlistees by occupational area. These exhibited substantial uniformity. Because the data pertained to individuals who, for the most part, entered the Navy at the same time, this finding suggests that for first-term enlistees, differentials in pay and promotion among Navy occupations are small. This is in sharp contrast to the large variance in pay among civilian occupations. Based on the data presented, it appears that the mix of reenlistments can be improved by allocating a larger percentage of the higher ranks to those ratings where the shortage of personnel is most severe.

Reenlistment rate data for careerists indicate that the propensity to enlist among individuals in this group is motivated by other factors besides pay. It also appears that differences in pay among occupations are small for this group. It might be argued that this is optimal since variations in reenlistment rates among occupations are also small. Here again, a pay structure which takes account of opportunity costs in the civilian sector could lead to an improved mix of reenlistments.

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